

EXECUTIVE SUMMARY

The estuarine trawl fishery in North Carolina is composed of two harvesting sectors, shrimp and crab trawls. The incidental capture of juvenile finfish and shellfish in conjunction with these fisheries has long been a concern to managers, fishermen, and the public alike. The magnitude of the bycatch is highly variable, influenced by, time, area, depth, and bottom and gear characteristics. Unfortunately, adequate fishery-independent and dependent data are unavailable to quantitatively address this problem. There is general agreement among all concerned that methods that reduce bycatch through manipulation of existing gears or by developing new gears that are species specific need to be examined. The objectives of this study were to: 1) test two tailbag sizes (4 in and 4.5 in) and a belly trawl in crab trawls; 2) develop and test various shrimp pot designs; and 3) examine the feasibility of using cast nets to harvest brown shrimp in the Pamlico Sound complex.

The 4 in tailbag reduced finfish bycatch (all fish species except for southern flounder) by 44.4%, while the 4.5 in tailbag reduced finfish bycatch by 79.6%, when compared to the control net catches (3 in tailbag). There was a 30.9% reduction in the total weight of southern flounder caught in the 4 in tailbag, while southern flounder catches in the 4.5 in tailbag were reduced by 54.5%. The 4 in tailbag reduced the number of sublegal (< 330 mm) southern flounder by 39.5% and legal southern flounder by 41.2%. Reduction rates for sublegal southern flounder in the 4.5 in tailbag were 75.8%, while there was a 12.5% gain in the number of legal southern flounder caught in this tailbag. There was a 12.2% reduction in the total weight of blue crabs caught in the 4 in tailbag, while the 4.5 in tailbag reduced the overall catch of blue crabs by 35.8%. The 4 in tailbag reduced the number of sublegal [≤ 5 in (127 mm)] blue crabs by 12.6% and the number of legal crabs by 7.3%. Reduction rates for the 4.5 in tailbag were 52.7% sublegal and 17.5% legal. The belly trawl, a 3 ft by 7 ft panel of 12 in stretched mesh webbing sewn into the bottom of a crab trawl immediately behind the footrope, reduced the number of sublegal southern flounder by 23% and legal southern flounder numbers were reduced by 22%. Catches of other organisms were so small that no comparisons were made.

Five shrimp pot designs were tested. Six brown shrimp were caught in 313 trap nights. Overall, six species of fish and two species of crustaceans were captured in the shrimp pots.

Nineteen brown shrimp and one white shrimp were captured in 139 throws of the cast nets. The 5/8" bar net had the highest CPUE for brown shrimp and the highest CPUE for this species was over bait balls.

Although blue crabs are the primary target species in the crab trawl fishery, an unlimited quantity of legal southern flounder may be also be taken. Numerous marketable species of other finfish are also landed (spot, catfish, etc.). The major draw back to the adoption of a 4.5 in stretched mesh tailbag regulation for crab trawls would be the loss of legal crabs (~17%). However, these individuals would not be lost to the fishery and the reduction of the fishing mortality on sublegal crabs should increase the overall harvest of legal blue crabs. The added benefits of southern flounder and finfish reduction that would be